REMARKS

Applicant has carefully reviewed the Office Action mailed March 6, 2007 and offers the following remarks.

Claims 1-8, 11-20, 23-32, 35-44, 47, and 48 were rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 7,126,996 B2 to Classon et al. (hereinafter "Classon"). Applicant respectfully traverses. For a reference to be anticipatory, the reference must disclose each and every claim element. Further, the elements of the reference must be arranged as claimed. MPEP § 2131. The requirement that each and every element be disclosed in the manner claimed is a rigorous standard that the Patent Office has not met in this case.

Before addressing the rejection, Applicant provides a brief overview of the present invention. The present invention provides an improved channel quality indicator indicia for orthogonal frequency division multiplexing (OFDM) communication environments. In addition to taking into consideration carrier-to-interference ratios, the present invention also takes into consideration the degree to which the channel response varies among the sub-carriers throughout the OFDM frequency band. The carrier-to-interference ratio and the degree of channel response variation are directly or indirectly used by a base station to select coding and modulation schemes for transmissions from the base station to the mobile terminal reporting these factors. Further, scheduling of data sent to the mobile terminal and other mobile terminals competing for the same channel resources may also be based in part on the carrier-to-interference ratio and the degree to which the channel response varies.

The variation of the channel gain throughout the OFDM frequency band may be calculated by determining the standard deviation of the channel gain throughout the sub-carriers of the OFDM frequency band. Preferably, standard deviation is calculated using the logarithm of the various channel gains. The sub-carriers for which the variation is considered are preferably those sub-carriers used for data transmission, wherein those sub-carriers on the outside boundaries of the OFDM frequency band used for interference buffering are not considered.

The carrier-to-interference ratio and the degree to which the sub-carriers vary are generally measured at the mobile terminal and may be sent to the base station in any number of formats. Measures of each of these indicia may be sent to the base station, which will take the two factors and determine a channel quality indicator. Alternatively, the mobile terminal can arrive at a channel quality indicator value, which is sent to the base station and is then used to select coding and modulation, as well as to assist in scheduling data for transmission.

Exemplary claim 1 recites a method comprising:

a) receiving from a mobile terminal channel quality indicator indicia bearing on a degree to which a channel response varies across sub-carriers over an orthogonal frequency division multiplexing frequency band; and

b) controlling transmission of information to the mobile terminal based on the channel quality indicator indicia.

Applicant respectfully submits that Classon does not teach "receiving from a mobile terminal channel quality indicator indicia bearing on a degree to which a channel response varies across sub-carriers over an orthogonal frequency division multiplexing (OFDM) frequency band," as set forth in claim 1. The Patent Office asserts that Classon teaches this element at col. 5, lines 29-67; col. 7, lines 39-54, and col. 11, lines 4-59. (Office Action mailed March 6, 2007, p. 2). Applicant respectfully traverses.

Classon discusses determining whether channel quality data is trustworthy (Classon, col. 5, lines 29-31). Classson discloses that channel quality indicator data may be averaged over a plurality of sub-carriers or discretely provided for individual subcarriers (Classon, col. 5, lines 36-39). To assess whether such data is likely to be trustworthy, Classon teaches considering data such as information that tends to reflect at least a channel coherence time attribute of the transmission target of interest. The channel coherence time information reflects a rate of change of channel characteristics (see Classon, col. 5, lines 43-67). Thus, Classon merely discusses how fast channel characteristics change **over time** in order to determine whether the channel quality data is trustworthy. Classon does not disclose channel quality indicator indicia bearing on **a degree** to which a **channel response varies across sub-carriers over an OFDM frequency band**.

Column 7, lines 39-54 of Classon merely discloses that the amount of feedback information sent back might depend on the variation of the channel frequency response, with a first mode using only a single value for the band and the second mode using values for at least two groups of subcarriers. However, Classon discloses that it is **the amount of feedback sent** that depends on the variation of the channel frequency response, not **the channel quality indicator indicia**. Further, the cited passage of Classon does not disclose that the **channel**

quality indicator indicia bears on **a degree** to which a channel response varies. Moreover, Classon mentions the variation of the channel frequency response, but it does not disclose that the channel response variation is **across sub-carriers over an OFDM band**, as recited by the present invention. Thus, Classon, column 7, lines 39-54, also does not teach "channel quality indicator indicia bearing on a **degree** to which a channel response varies **across sub-carriers over an orthogonal frequency division multiplexing frequency band**."

Classon teaches that when the channel is changing too quickly for the channel quality data to be trustworthy, the terminal is classified as a Type 2 user and the terminal can compute the average C to I ratio across the subcarriers of the channel and provide this information in the feedback channel portion of the uplink frame (Classon, col. 11, lines 4-16). Notably, the average C to I ratio across the subcarriers is not the claimed "degree to which a channel response varies across sub-carriers over an OFDM band." If the channel conditions are not changing too quickly for the channel quality data to be trustworthy, the mobile terminal is classified as a Type 1, and the mobile terminal can develop channel quality information (such as determining C to I for at least some of the subbands). If the mobile terminal is a Type 2, then the base site can select a particular modulation and coding scheme based upon the overall band average C to I information, or the band average C to I information can be averaged over a period of time (Classon, col. 11, lines 39-49). If the mobile terminal is a Type 1, the base site can select a particular modulation and coding scheme based upon the individual subband C to I information (Classon, col. 11, lines 49-57). In neither situation does Classon teach controlling transmission of information to the mobile terminal based on channel quality indicator indicia bearing on a **degree** to which a channel response **varies across sub-carriers over an OFDM band**, as claimed by the present invention.

To summarize, Classon teaches an average channel quality indicator over a group of subcarriers and focuses on changes to the channel quality indicator **over time**. Thus, Classon does not teach channel quality indicator indicia bearing on a **degree** to which a channel response **varies across sub-carriers over an OFDM band**.

Additionally, Classon does not teach controlling transmission of information to the mobile terminal based on the channel quality indicator indicia, which bears on a degree to which a channel response varies across sub-carriers over an OFDM band. Instead, Classon teaches determining which transmission selection mode is used based on whether the channel quality data is trustworthy (which may be based, for example, on the speed at which the transmission target is moving) (Classon, col. 6, line 66 through col. 7, line 12). The modulation and coding scheme can be selected based on the average channel quality, which may include averaging over multiple subcarriers as well as time (Classon, col. 7, lines 18-24). Thus, in Classon, the transmission is controlled based on the average channel quality as averaged over multiple subcarriers and over time, and not controlled based on channel quality indicator indicia bearing on a degree to which a channel response varies across sub-carriers over an OFDM band. Acordingly, Classon does not teach this element of claim 1 either.

Since Classon does not teach each and every element of claim 1, Classon cannot anticipate claim 1. Independent claims 13, 25, and 37 contain limitations similar to those in claim 1, and are thus patentable for at least the same reasons as set forth above with respect to claim 1.

Claims 9, 10, 21, 22, 33, 34, 45, and 46 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Classon in view of U.S. Patent Application Publication No. 2005/0031028 A1 to Chiu (hereinafter "Chiu"). Applicant respectfully traverses. To establish *prima facie* obviousness, the Patent Office must show where each and every element of the claim is taught or suggested in the combination of references. MPEP § 2143.03. If the Patent Office cannot establish obviousness, the claims are allowable.

Claims 9 and 10 depend indirectly from claim 1. Claims 21 and 22 depend indirectly from claim 13. Claims 33 and 34 depend indirectly from claim 25. Claims 45 and 46 depend indirectly from claim 37. Thus, each of these claims contains limitations similar to those in claim 1. As set forth above, Classon does not teach channel quality indicator indicia bearing on a **degree** to which a channel response **varies across sub-carriers over an OFDM band**. Chiu does not cure the deficiencies of Classon in this regard. Thus, claims 9, 10, 21, 22, 33, 34, 45, and 46 are patentable for at least the same reasons as set forth above with respect to claim 1

The present application is now in condition for allowance and such action is respectfully requested. The Examiner is encouraged to contact Applicant's representative regarding any remaining issues in an effort to expedite allowance and issuance of the present application.

Respectfully submitted,

WITHROW & TERRANOVA, P.L.L.C.

By:

John R. Witcher, III
Registration No. 39,877
100 Regency Forest Drive, Suite 160
Cary, NC 27518
Telephone: (919) 238-2300

Date: June 6, 2007
Attorney Docket: 7000-294